PCT

512 Rec'd PCT/PTO 28 MAY 1999

09/319142

JC488 U.S. PTO 09/319142 05/28/99

FORM PTO-1390 (REV. 10-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	U.S. APPLICATION NO. (If known, see 37 CFR 1.5
45/235 Li/Sch	Unknown

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP98/06074	23 September 1998	30 September 1997

TITLE OF INVENTION
GEMSTONE

APPLICANT(S) FOR DO/EO/US
Ernst Michael Winter, Lothar Schäfer and Thorsten Matthee

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [ ] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [ ] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [X] Other items or information:
    Affidavit

"Express Mail" Mailing Label Number EL 383 010 412
Date of Deposit May 28, 1999
I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

Bernice Marquez
Bernice Marquez, Sec'y

Rec'd PCT/PTO 2 3 MAY 1999

U.S. APPLICATION NO (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/319142 Unknown	PCT/EP98/06074	45/235 Li/Sch

17. ☐ The following fees are submitted:

	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1070.00		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $930.00		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $790.00		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) $720.00		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $98.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 840.00	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		x $22.00	$	
Independent claims	- 3 =		x $82.00	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$	
TOTAL OF ABOVE CALCULATIONS =				$ 840.00	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28). +				$	
SUBTOTAL =				$ 840.00	
Processing fee of $130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$	
TOTAL NATIONAL FEE =				$ 840.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +				$	
TOTAL FEES ENCLOSED =				$ 840.00	
				Amount to be refunded:	$
				charged:	$

a. ☒ A check in the amount of $ 840.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-1653. A duplicate copy of this sheet is enclosed.
In the event there is any discrepancy in the amount sent herewith or at any time in the future, please charge any additional fee or credit any overpayment to the above deposit account number.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:
ROBERT W. BECKER & ASSOCIATES
11896 N. Highway 14
Suite B
Tijeras NM 87059

Robert W. Becker
SIGNATURE
Robert W.Becker
NAME
26,255
REGISTRATION NUMBER

45/235Li/Sch

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

( ) the owner of the small business concern identified below:

(X) an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN WINTER CVD TECHNIK GMBH

ADDRESS OF CONCERN Königgrätzstrasse 14, 22609 Hamburg, Germany

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled GEMSTONE by inventor (s) Ernst Michael Winter, Lothar Schäfer, Thorsten Matthee described in:

( ) the specification filed herewith.

(X) application serial no. 09/319,142, filed 23 September 1998 (International Filing Date)

( ) patent No. _____, issued _____.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

NAME _____

ADDRESS _____

( ) INDIVIDUAL ( ) SMALL BUSINESS CONCERN ( )NONPROFIT ORGANIZATION

NAME _____

ADDRESS _____

( ) INDIVIDUAL ( ) SMALL BUSINESS CONCERN ( )NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING _____

TITLE OF PERSON OTHER THAN OWNER Prokurist

ADDRESS OF PERSON SIGNING Winter CVD Technik GmbH Königgrätzstr. 14 / 22609 Hamburg

SIGNATURE _____ DATE 15 June 1999

(I. Reincke)

TOTAL P.01

09/319142
2 MAY 1999

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

"Express Mail" Mailing Label Number US 383 010 412 US
Date of Deposit May 28, 1999
I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Bernice Marquez
Bernice Marquez, Sec'y

09319142 - 052899

In the application of:	Ernst Michael Winter, Lothar Schäfer, and Thorsten Mathee
Serial Number:	unknown (Based on PCT/EP98/06074)
International Filing Date:	September 23, 1998
For:	GEMSTONE

Assistant Commissioner for Patents

Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to the first Office Action, please amend the above identified application as follows:

IN THE SPECIFICATION:

Page 1: after the title, insert the following heading:

-- Background of the Invention --.

Page 3: between lines 4 and 5, please insert the following heading:

-- Summary of the Invention --.

Page 7: before line 1, please insert the following heading:

-- Brief Description of the Drawings --;

before line 14, please insert the following heading:

-- Description of Preferred Embodiments --.

Page 8: after the last line, please insert the following paragraph:

-- The specification incorporates by reference the entire disclosure of German priority documents 297 17 496.7 of September 30, 1997, and of International Application PCT/EP98/06074 of September 23, 1998.

The present invention is, of course, in no way restricted to the specific disclosure of the specification and drawings, but also encompasses any modifications within the scope of the appended claims. --.

IN THE CLAIMS:

Please cancel claims 1-15 and replace them with the attached claims 16-31.

IN THE ABSTRACT:

Please add the attached Abstract of the Disclosure.

REMARKS

Claims 16-31 are pending in the application; claims 1-15 have been canceled.

Appropriate headings have been added to the specification, a proper Abstract of the Disclosure has been added. Furthermore, the claims from the literal translation have been replaced by claims drafted in conformity with U.S. Patent practice.

The application in its amended state is believed to be in condition for allowance.

Respectfully submitted,

Gudrun Huckett

Ms. Gudrun E. Huckett, Reg. No. 35,747, for the applicant

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Telephone: (505) 286-3511
Telefax: (505) 286-3524

-/GEH
Enclosures - claims 16-31
- Abstract of the Disclosure

WHAT IS CLAIMED IS:

16. Gemstone comprising:

a plate-shaped support having a surface with at least one pyramid-shaped depression; and

a precious stone layer (1) produced by vapor phase deposition on said plate-shaped support.

17. Gemstone according to claim 16, wherein said plate-shaped support is a silicon wafer.

18. Gemstone according to claim 17, wherein said silicon wafer has (100) or (111) orientation.

19. Gemstone according to claim 16, wherein said plate-shaped support is comprised of a precious metal.

20. Gemstone according to claim 16, wherein said plate-shaped support is comprised of hard metal.

21. Gemstone according to claim 16, wherein said plate-shaped support is comprised of a refractive metal such as tungsten or molybdenum.

22. Gemstone according to 16, wherein said at least one pyramid-shaped depression is produced mechanically.

23. Gemstone according to claim 22, wherein said at least one pyramid-shaped depression is produced by cutting or stamping.

24. Gemstone according to 16, wherein said at least one pyramid-shaped depression is produced by etching.

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25. Gemstone according to claim 16, wherein the pyramid angle of said at least one pyramid-shaped depression within said plat-shaped support differs.

26. Gemstone according to claim 16, wherein the pyramid angle of said at least one pyramid-shaped depression is approximately 109°.

27. Gemstone according to claim 16, wherein grain boundaries of said precious stone layer (1) are aligned in a column shape.

28. Gemstone according to claim 16, wherein said at least one pyramid-shaped depression have a mirror surface.

29. Gemstone according to claim 16, wherein an upper surface of said precious stone layer facing away form said plate-shaped support (1) is cut.

30. Gemstone according to claim 16, wherein said precious stone layer (1) has a color produced by doping.

31. Gemstone according to claim 16, wherein a surface of said plate-shaped support, on which said precious stone layer (1) is supported, is curved.

Abstract of the Disclosure

A gemstone has a plate-shaped support having a surface with at least one pyramid-shaped depression. A precious stone layer is produced by vapor phase deposition on the plate-shaped support. The precious stone layer can be cut.

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GEMSTONE

The invention relates to artificial gemstones.

Gemstones, especially precious stones, are cut or polished before they are mounted in the metal body of a piece of jewelry in order to provide spectral diffraction of the incident light and to reflect the incident light, thus resulting in the brilliance and fire of the gemstone. However, this requires a minimal size and purity of the gemstone. For example, two thirds of the mined diamonds are not suitable for producing gemstones by cutting because they are either too small, have not the required height, or because of their color or inclusions can only be used for industrial (technical) purposes.

The brilliance, respectively, the luster of the diamond results from the portion of the incident light impinging on the gemstone being reflected in the direction where the light is coming from. This is achieved in that the light which impinges through the upper facets into the diamond crystal is reflected at the lower brilliant area and exits through the upper facets. The light is thus reflected in at least two reflection steps by a total of approximately (180° $\pm$ x °) . The arrangement of the facet angle relative to one another must take into consideration the optical properties of the boundary surface diamond/air so that the angle of total reflection is never surpassed.

It is important in the context of the beam path within the diamond that at the back facets, i.e., at the lower portion of the diamond, the angle of the light beam path is always greater than the angle of total

reflection. This means that the light is reflected back upwardly, while it must impinge on the upper facets and the table with such an angle that the light can exit. Diamond brilliants are not cut such that the light is reflected exactly in the direction in which it impinges on it, as is the case for reflectors instead, between the incident and the exiting light beam an open angle is provided which results in reflection that will impinge on the eye. The exit angle is different due to the dispersion for different wavelengths.

An important feature for the fire of the brilliant is the dispersion of light within the diamond which results in that the light is diffracted as it is in a prism and is then perceived by the eye as spectral colors.

Further effects which occur when viewing a brilliant are the many reflections which come from the facets and impinge on the eye when the brilliant is turned. These are the essential objectives that must be fulfilled by the facets.

Artificial diamond layers which are produced by CVD processes are either too expensive or too thin to produce therefrom cut gemstones, for example, brilliants, which can provide the impressive luster that determines their value. Important for the luster is the adherence to a precise geometric shape in order to reflect a portion of the incident light as large as possible into the impinging light direction.

It is an object of the invention to provide artificial gemstones from precious stone layers produced by vapor phase deposition on large surface areas which, despite the unfavorable dimensions, i.e., the limited thickness of such layers, provide an attractive appearance.

This object is inventively solved with a gemstone which is comprised of a preferably plate-shaped support or substrate having one surface that is provided with at least one pyramid-shaped depression and which supports a precious stone layer that is produced by vapor phase deposition, preferably according to the CVD or PVD methods.

In order for the precious stone layer, especially diamond layer, of the inventive gemstone to have the required brilliance, its underside that is resting on a support, for example, a silicone wafer, must be embodied such that, as in the case of the single crystal natural brilliance, it will produce a reflection of most of the incident light. This can be achieved by a respective pre-treatment of the surface of the silicon wafer to be coated. According to this pre-treatment, the silicon wafer has the required shape as a negative matrix so that the backside or underside of the diamond layer to be formed will have the respective positive shape. As a support or base for such artificially produced diamond layers, silicon wafers are especially suitable but also such materials as precious metals, tungsten, molybdenum, or hard metals which can be coated easily with diamond and at whose surface a structure as required can be produced.

Producing the structure in the support to be coated can be achieved, as a function of its material, by mechanical means, i.e., cutting a certain profile, by electrolytic means or, especially in the case of silicon wafers, by chemical or plasma-technological means by etching. It is possible to employ isotropic as well as anisotropic methods. As an anisotropic etching medium, KOH can be used. This base results in the formation of pyramid-shaped etching depressions in a single-crystalline wafer. When employing an etching mask, it is also possible to produce by an isotropic etching medium a pyramid-shaped structure in a support. A suitable composition of the etching solution can produce the required angles of the pyramid. If as mentioned above, a stepwise reflection by approximately 180° $\pm$ x ° is desired, the angles of the pyramid must be adapted accordingly.

The edge area of the support of the gemstone layer can be provided with other pyramid angles than the center portion. However, it is also possible to provide the reflecting surfaces (facets) at the underside of the layer with different angles. In this manner, the brilliance and the fire can be adjusted independent from one another. The angles of the facets can be selected such that the light in the gemstone layer is reflected multiple times so that a great diffraction of the spectral colors can be achieved.

It is easiest to provide with a single etching action on the entire surface of the support the same angle, having, for example, a pyramid opening angle of 109°. This angle can be achieved easily

by etching processes. Before etching is carried out, the surface of the support can be subjected to a laser action in order to provide the desired geometry.

It is also possible to use wafers having other orientations than (100) or (111). Important in this context is the directed cooperation of the crystal orientation of the precious stone layer and the direction of the etching action in order to provide an optimal optical effect. In a polycrystalline artificial diamond layer, for example, produced by a CVD method, in contrast to a single crystal diamond crystal grain boundaries are present which must be taken into consideration as additional refracting areas having a different refractive index. This has the consequence that the grain boundaries advantageously must be aligned with respect to their structure, for example, in a column-like arrangement, in order to provide a positive effect on brilliance and fire. In any case, the effect of the grain boundary must be taken into consideration for the optical effect.

In a simple pyramid shape the light can also be refracted by providing a mirror layer on the backside or underside of the vapor phase precious stone, especially a CVD diamond, in the form of gold or titanium layer. Then, the reflection will result from reflective action at the gold or titanium surface acting as a mirror.

In order to approximate as closely as possible the brilliance and the fire of single crystal brilliants, an octahedron shape of the surface of the artificial diamond layer is advantageous which can be cut

subsequently to its production. The angles at the underside must be matched to the changed exit ratios.

These carriers, having a precious stone layer produced by vapor phase deposition, can be used as gemstones in the conventional manner, for example, can be mounted on a metal body of a piece of jewelry.

The surface of the support or substrate carrying the deposited precious stone layer must not be planar. For example, it can be convex in order to provide artificial gemstones in the shape of a cabochon or button.

The invention provides for manufacture of artificial gemstones, especially diamonds, not only with special optical properties such as brilliance and fire, but also with surface dimensions, for example, by multi dimensioning, that cannot be achieved even in approximation with natural stones and also not with other synthetic methods, especially not the high pressure/high temperature technology for economical and technical reasons. The inventive gemstone can be provided with its own colors employing a gas phase of a respective composition, for example, it is possible to provide a blue color by boron, or a yellow color by nitrogen, so that the inventive gemstones can be used for any suitable piece of jewelry or any suitable decoration purpose with precious stones.

One embodiment of the inventive gemstone will be explained with the aid of the drawings.

It is shown in:

Fig. 1 a schematic side view of the precious stone layer of a gemstone;

Fig. 2 a schematic view of the area Y of Fig. 1 in an enlarged representation;

Fig. 3 a schematic plan view onto the precious stone layer of Fig. 1;

Fig. 4 a schematic view of the precious stone layer according to Fig. 1 from below;

Fig. 5 a schematic view of the area X of Fig. 4 in an enlarged representation.

For reasons of simplification and clarity, only the precious stone layer 1 is shown in the drawings without the support, whereby the support has a side which is mirror-symmetrically formed relative to the precious stone layer 1.

The precious stone layer 1 has at its underside a plurality of pyramid-shaped projections 2 having an angle "A", while its upperside is provided with an octahedron facet cut.

The precious stone layer 1, which is fixedly adhered to the non-represented support and is cut, thus provides the inventive

gemstone which can be mounted in a piece of jewelry, for example, a ring.

The support onto which the precious stone layer is to be applied must not have the dimensions of the gemstone to be produced. When a large-surface area support is used and provided with a precious stone layer, parts can be cut therefrom and then processed to a gemstone.

Claims

1. Gemstone, characterized by a preferably plate-shaped support having a surface with at least one pyramid-shaped depression and supporting a precious stone layer (1) produced by gas phase deposition.

2. Gemstone according to claim 1, characterized in that the support is silicon wafer.

3. Gemstone according to claim 2, characterized in that the support is a wafer of (100) or (111) orientation.

4. Gemstone according to claim 1, characterized in that the support is comprised of a precious metal.

5. Gemstone according to claim 1, characterized in that the support is comprised of hard metal.

6. Gemstone according to claim 1, characterized in that the support is comprised of a refractive metal such as tungsten or molybdenum.

7. Gemstone according to one of the claims 1 through 6, characterized in that the pyramid-shaped depressions are produced by mechanical, for example, cutting or stamping, means.

8. Gemstone according to one of the claims 1 through 6, characterized in that the pyramid-shaped depressions are produced by etching.

9. Gemstone according to one of the preceding claims, characterized in that the pyramid angle of the depressions within a support may differ.

10. Gemstone according to one of the preceding claims, characterized in that the pyramid angle of the depressions is approximately 109°.

11. Gemstone, according to one of the preceding claims, characterized in that the grain boundaries of the precious stone layer (1) are aligned in a column shape.

12. Gemstone according to one of the preceding claims, characterized in that the pyramid-shaped depressions have a mirror surface.

13. Gemstone according to one of the preceding claims, characterized in that the surface of the precious stone layer (1) is cut.

14. Gemstone according to one of the preceding claims, characterized in that the gemstone layer (1) has its own color produced by doping.

15. Gemstone according to one of the proceeding claims, characterized in that the surface of the support supporting the precious stone layer (1) is curved.

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Substitute Sheet (Rule 26)

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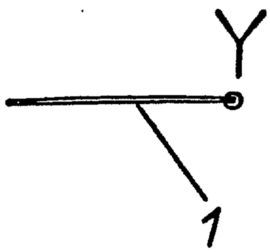
FIG.1



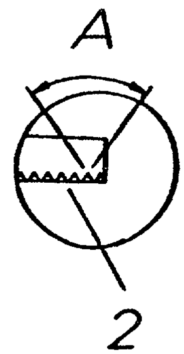


FIG.2

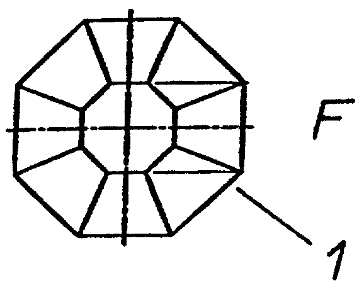


FIG.3

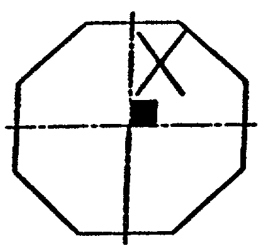


FIG.4

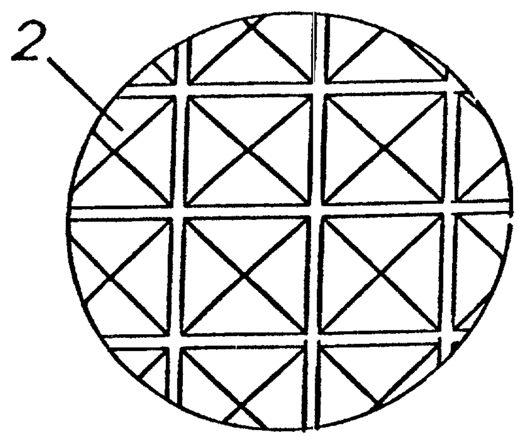


FIG.5

Attorney Docket No.
45/235Li/Sch

COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought of the invention entitled:

GEMSTONE

the specification of which
_____ is attached hereto;
__X__ was filed on 23 Sept. 1998 as Application Ser.No. 09/319,142 and was amended on May 28, 1998 (International Date)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information known by me to be material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):			Priority Claimed:	
297 17 496.7	Germany	30 September 1997	X	
PCT/EP98/06074	International	23 September 1998	X	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

_____
(Application Number) (Filing Date)

I hereby appoint the following attorneys, Robert W. Becker, Reg. No. 26,255, and patent agent, Gudrun E. Huckett, Reg. No. 35,747, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. Address all telephone calls to (505) 286-3511. Address all correspondence to ROBERT W. BECKER & ASSOCIATES, 11896 N. Highway 14, Suite B, Tijeras, New Mexico 87059.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Ernst Michael Winter
Inventor's signature _____ Date: 10 May 1999
Residence: Königgrätzstrasse 14, 22609 Hamburg, Germany
Citizenship: German
Post Office Address: (same as above)

Full name of second inventor, if any: Lothar Schäfer
Inventor's signature _____ Date: 10. May 1999
Residence: Im Moorweg 1, 38527 Abbesbüttel, Germany
Citizenship: German
Post Office Address: (same as above)

-2-

3-00

Full name of third inventor, if any: Thorsten Matthee

Inventor's signature Thorsten Matthee Date: 10. may 1999 ~~10 June 1999~~

Residence: Pappelweg 19, 38527 Meine, Germany

Citizenship: German

Post Office Address: (same as above)